

it was found possible to obtain photographs on which the contrast between the eclipsed and uneclipsed parts of the lunar disc was very striking; on the photograph reproduced the latter is almost entirely obscured.

Several other observations recorded in the January *Bulletin de la Société astronomique de France* confirm those made at Juvisy.

L'ANNUAIRE ASTRONOMIQUE ET MÉTÉOROLOGIQUE, 1909.—Amateur astronomers and meteorologists who read French will find M. Flammarion's year-book a valuable acquisition. The volume for 1909 contains the usual data, with the calendar of events so useful to amateur observers and others interested in astronomical phenomena, and some useful instructions to observers; the annual review of the progress of astronomy during the past year should also prove interesting. The "Annuaire" is published at 1.50 francs.

THE BRITISH SCIENCE GUILD.

THE third annual general meeting of members of the British Science Guild was held at the Mansion House on Friday last, January 22, under the presidency of the Right Hon. the Lord Mayor. We give this week extracts from the report of the executive committee presented by Sir W. Ramsay, and adopted on the motion of Sir Frederick Pollock, seconded by Sir Oliver Lodge.

The president of the Guild, in his address at the annual meeting last year, remarked:—"It is known now that without skill it is impossible to hold your own in the competition of the day. The change that has come over things in the last fifty or sixty years is immense. Without science no one can organise his business; without science no nation can keep its place in the van. Therefore, one of the great responsibilities of the nation is, not only to keep her knowledge in the minds of a few individuals abreast of the age, not only to produce her Kelvins and her Darwins, but to see that her science is disseminated and that it enters the mind and actuates the endeavours of her Captains of Industry generally. This is the creed of the Guild, and that is the lesson which we ourselves have endeavoured to teach."

During the year the Guild has steadily laboured forward, and, in spite of the vast quantity of inertia against which its missionary efforts have to contend, the nation is gradually commencing to realise the importance of the scientific spirit. Public speakers, particularly those who have to do with educational subjects, are almost unanimous in urging the importance of the inclusion of science in all educational schemes.

Dr. Warren, the Vice-Chancellor of Oxford University, at the last annual meeting made the following striking remarks:—"If there is one thing about which I have been persistently keen all through my academic career, it has been the desire to introduce science into the regular and compulsory curriculum of Oxford, to ensure that everyone who takes the ordinary degree should at least know what science and the scientific attitude of mind are like. I hope I shall see this accomplished before my own active career closes."

Following this, Sir William Anson, the representative in Parliament of the same University, has recently said:—"No boy should leave school without the rudiments of one branch of science and some knowledge of scientific method."

The Chancellor of the Exchequer recently affirmed at Bangor that what is wanted is not only teachers, but also explorers. Science has its dark continents, unlimited oceans, chartless. Germany has said, You must have a university to teach and to educate and to develop the German mind, and now the effect is seen in the German industries.

Visiting recently one of the largest workshops in Germany, he was taken round by a professor. In these workshops the professors are the experts. The Germans get their ideas from their professors. We in this country heave coal and blast rocks, but the great industries that finish these products are elsewhere. The universities are the factories where the future of the country is being

forged. *There is no investment that will produce such a return, not to the investor, but to the generations to come, as the endowment of higher education.*

The public Press is also becoming more constant in pointing out the need of scientific education; in urging that with each year it becomes more clear that scientific knowledge is the root of both social prosperity and social progress; that the real function of a university is not to teach men a business, but to cultivate their intellects, to make them the best possible citizens, and, humanly speaking, the most accomplished citizens; that a university ought to be the nursery of our leaders of industry, of our politicians and professional classes; *of all men, in fact, upon whose initiative and by whose counsel the great affairs of the nation are carried on.*

It was mentioned in last year's report that the main educational advance had been in primary education. This has again been the case in the year just passed. Of course it is of the utmost importance that primary education should be efficient, because unless there is a sure foundation the edifice can never be satisfactorily completed; but it must be remembered that secondary education is also of the highest importance. Unfortunately, owing to religious and denominational differences, there is much unrest in the educational world, and this most seriously militates against efficiency. Until some adequate settlement, agreeable to all parties in the controversy, is arrived at, the cause of true education must inevitably suffer.

In Scotland, where sectarian strife is happily non-existent, primary and secondary education reach a much higher level than in the rest of the United Kingdom. It is with the sincerest pleasure that we note the passage into law of the Scottish Education Bill, which deals in particular with compulsory attendance at continuation schools.

In connection with the higher scientific and technical education, the Imperial College of Science is now being organised, and the appointment of Dr. Bovey as its principal is noted with particular pleasure. As a consequence of this reorganisation, the technological education of London is being placed on a much firmer footing.

The Senate of the University of Manchester, having realised the necessity of the times, are fitting out new laboratories, a number of them to be employed entirely for chemical research in connection with commercial problems.

In last year's report attention was directed to the very meagre national endowment of the universities of Great Britain and Ireland. It is much to be regretted that the Government have not seen their way to increase this national endowment, which, compared with what is granted to universities abroad, is infinitesimal. The sight of the ancient universities struggling to obtain an adequate sum from private sources to enable them to carry out needed reforms is one which could not be witnessed on the Continent of Europe.

It is now universally admitted that those countries which most efficiently support their universities and technical schools, and where education of the highest class can be obtained the most readily with the lowest fees, are most in a position to command the markets of the world. Surely it is high time that more attention was paid by the State to the needs of the universities and colleges. It should be realised that there are many steps to be taken beyond primary education if the nation is to be in a position to compete with its rivals. Our national system of education must eventually include the universities.

The neglect of higher education, and the difficulties of finding ways and means which the universities have had to put up with, account for the loss of many specialised trades to the country. Little can be expected from a university or technical institute which is always in the throes of trying to make income balance expenditure. It sometimes happens that a beneficent donor will give a new wing or building to a university or institute, but forgets that such a building will require a staff and an income to keep it up. The consequence of this is that fees are often exorbitant, and students who have the ability to take advantage of the instruction, but not the pecuniary means, are prevented from attending. It also causes the staff to be inadequate, overworked, and underpaid. An overworked staff is unable to spare time for original investigation, and

the natural sequence is that unless they have extraordinary energy they neglect research, lose their originality, and in consequence, become inefficient teachers.

We are glad to acknowledge that in many ways the present Government has made new departures in directions which cannot fail to benefit the nation by bringing science to bear more fully upon various departments and utilising it to greater effect.

We also note an increasing recognition of the national importance of the work done by scientific men, and of the men themselves as nation builders. A remarkable indication of this new spirit was recently afforded by the official dinner, presided over by a Cabinet Minister, given to the members of the International Conference on Electrical Units, and provided for out of a new fund.

The new Irish Universities' Bill, which enacts that universities shall be erected and endowed in Dublin and Belfast, is very welcome, and there is already some evidence that advantage will be taken of the greater educational opportunity thus given to the Irish people.

The Colonial Office, after consultation with the Royal Society, has established a national bureau in London to deal with sleeping sickness, that terrible disease which decimates yearly the population in many of our tropical possessions. The cost of administration is to be defrayed from imperial funds, including a contribution from the Sudan. The bureau was established in June, and one of the rooms of the Royal Society has been placed at its disposal.

After centuries of neglect, the condition of our ancient and historic monuments is now recognised as a matter worthy of the nation's care. Three Royal Commissions have been appointed dealing with them in England, Scotland, and Wales respectively.

The Board of Trade has appointed a committee to deal with international exhibitions, in order to organise and arrange the part to be taken by this country in connection with them. This permanent committee is to take the place of the special commissions which have in the past been appointed by Government to deal with each large international exhibition. In all probability, by having a permanent committee, a more continuous policy will be evolved. The French have had such standing committees for many years, the committees having to deal both with internal exhibitions and with those held outside France. They have also a special organisation to deal with jury awards, and it would be well if some such organisation could be arranged in this country. The value of such an organisation was particularly noticed by those who served on the juries at the Franco-British Exhibition. The French jurors came over here completely organised, but the British jurors had to start their organisation *de novo*. If there had been a British standing committee to arrange beforehand the *modus operandi*, this would not have been the case, and much valuable time would have been saved.

In consequence of the new allocation of the land following the withdrawal of the Board of Education from South Kensington, the Solar Physics Observatory, which was founded by the Government in 1879, and located there as a temporary measure, is to be removed elsewhere. It has been decided to locate it near Caterham, to occupy a position 900 feet high, previously a mobilisation centre, which has been placed at the disposal of the observatory by Mr. Haldane. In the near future, therefore, it will be possible to carry on the important investigations under much more satisfactory conditions.

The President of the Local Government Board has authorised for the current year a large number of researches in connection with the annual grant voted by Parliament in aid of scientific investigation connected with the causes and progress of disease; also chemical and bacteriological investigation, as to the influence of softening and other chemical processes on the purity of water supplies from chalky sources.

The Board of Agriculture has shown increased activity, and although little is so far done for research, pamphlets of great use to farmers have been widely distributed.

The appointment of these committees and the increased means of research are steps in the right direction, but they are purely departmental.

It is interesting in this connection to direct attention to

the speech made by our president at the anniversary dinner of the Chemical Society nearly four years ago (*Daily Telegraph*, March 30, 1905):—"Mr. Haldane expressed his conviction that the problem that lay in front of the British nation was how to develop the grey matter of the executive brain. All the controversies that agitated the minds of politicians were of less importance than the big question of how to make the permanent element in politics more powerful and better. There was too little science in it at the present time. There was hardly a department which did not require the aid of science if it was to be effective, but there were not attractions like those held out by private firms and foreign Governments to lead men of the highest attainments to put themselves at the disposal of the State. Was it impossible to hope for the birth of an era when the head of the Government should have at his disposal a corps of the finest brains which the nation could produce? If great Britain was to hold her own, she must not be behind Germany, the United States, or France in this matter."

The importance to the nation of such a council as that referred to by Mr. Haldane was first pointed out by the Duke of Devonshire's Commission in 1874.

As mentioned in last year's report, a deputation of the Guild on the pollution of rivers and water supplies was received by the Right Hon. John Burns (President of the Local Government Board) on October 31, 1907. Mr. Burns expressed his intention of bringing in a Bill to deal with the subject in the spring of 1908. No legislation upon this subject was, however, brought forward. It is hoped that this does not mean that nothing is to be done next session, as the matter is one of the utmost urgency.

Conveyance of Scientific Literature at Reduced Rates.

The question of a reduction in postal rates on scientific literature was brought before the Postmaster-General by a deputation organised by the Guild, and received by him on March 12, 1908.

The following memorandum was submitted to the Postmaster-General by the deputation:—

This deputation has been organised by a committee of the British Science Guild, and represents seventy-five societies which have asked to have this matter favourably considered. The names of these societies are given as an appendix.

This list of societies is very far from exhaustive, and, as a matter of fact, only 100 societies were consulted in the first instance, a good many of which by their position could not take action in this matter. It will be understood, therefore, that there is an almost unanimous desire on the part of the scientific and learned societies in Great Britain and Ireland that the Government will see its way to help them in the matter which is now put forward.

These societies fully acknowledge the sympathetic treatment which a few of their number have received from the Government in such matters as the provision of rent-free quarters, monetary help in the prosecution of original research, in exemption from income tax, and in other ways, but they wish to point out that only a few societies really benefit by the first two of these concessions, and that even then this help is small.

The societies wish, however, that these may be taken as precedents for conferring upon them the further small benefits which they now ask for.

This deputation would claim that the scientific and learned societies in this country are thoroughly deserving of sympathetic and generous aid from the Government, for the advancement of science and of original investigation in Great Britain is to a large extent due to their fostering care and to the fact that they afford facilities for the publication of original work and for its free discussion, and by circulating large numbers of their proceedings and transactions describing such original work, they disseminate widely the most recent scientific and other discoveries.

The societies in question are thus practically the custodians of the national advance in science, and it is almost a truism to say that the material progress of the country is strictly dependent on the applications of science, and hence that such societies help largely in keeping our country in a position to compete with other countries in commerce and industry, and that without this continuous

advance in scientific work Great Britain must gradually recede from its premier position among nations.

The work of these societies not only fosters the advance of science, but it is largely educational, and this educational work is of the highest type, as it follows on after the ordinary general education is finished. The present Government, it is known, is keenly anxious to foster education in every possible way, and it is suggested that this is a legitimate direction in which aid is at once possible without any reference to politics and without undue expense.

The deputation wishes to urge very strongly that these societies are in no way working with the view of ulterior profit, but that they work solely for the advancement of knowledge and the well-being of our country. The deputation would invite reference in this connection to the balance sheets of various societies, and from these it will be seen that their expenditure is solely with the view of fostering science, and that in no way does any profit accrue to their members.

The cost of the publication of the journals of the various societies is a very large item in their expenditure, and the cost of the postage of their journals to the members is in many instances a very heavy tax on their resources. This item of cost handicaps such societies in many ways. A reduction in the rate of postage would give great relief to such societies, while the cost to the Post Office, and finally to the public, would be almost nominal.

So heavily do some of the societies feel this rate of postage on their publications that they now actually employ their own servants or special messengers to deliver their publications in London with considerable saving in expense to themselves. Cases may be mentioned showing this.

The deputation does not ask for any precise amount of reduction, but would plead for some consideration and help in the matter, and in passing would mention that the newspaper rates in this country are much lower than the rates at which scientific publications can be sent. The deputation also does not suggest any very hard and fast definition as to the line to be drawn between the publications of learned and scientific societies and other serial publications, but it is suggested that the case of each society, applying for any favourable rate which might be granted, should be considered by the Postmaster-General himself, and if he is satisfied that such society is working wholly (a) for the public benefit; (b) for the advancement of knowledge or learning; (c) without any view to profit to its members, and fulfils any other conditions the Postmaster-General may think fit to add, then such benefit could be granted to each individual society which may be approved.

With this end in view, the following is a suggested regulation for any concession which the Postmaster-General and the Government might be pleased to make:—

"Any publication coming within the following description can, on the application of the society, and upon payment of an annual fee of 5s., be registered at the General Post Office for transmission by inland post as a publication of a society as hereinafter defined."

DEFINITION OF A PUBLICATION. (Under this Section.)

"All such scientific, learned and technical publications as may be issued periodically not for profit, but for the advancement of knowledge by societies and institutions in the United Kingdom."

The deputation would urge that such a regulation (which may, of course, be amplified if necessary) would at once differentiate the publications for which relief is sought from all magazines and other similar periodical matter which are published as commercial speculations, whereas, on the other hand, if the rates of postage to be given to the periodicals by scientific societies are reduced, the definition above given could equally be used to assimilate their treatment with that already given to the newspapers in this country.

The executive committee of the Guild subsequently decided that it is undesirable to proceed at present any further in this question, but it is hoped that circumstances may prove to be more favourable later, when perhaps a further move may be made.

Reports of Committees.

During the year meetings of a number of committees have been held. In some cases the results obtained have been incorporated in the form of reports, from some of which extracts are given below. Two reports upon educational subjects appear elsewhere in the present issue.

Coordination of Charitable Effort.

At the last annual meeting of the Guild Sir William Bousfield directed attention to the want of coordination in charitable effort, and suggested that this would be a very fitting matter for the Guild to inquire into. As a consequence, a subcommittee was appointed to deal with the subject. In a memorandum drawn up for the committee Sir William Bousfield says:—

"There would appear to be few subjects on which scientific thought and deductions from practical experience in the past would be more valuable to the community than those relating to expenditure on relief of the poor and provision for sickness and incapacity for work. The amount spent at present out of the national income on these objects and the waste is extremely great. The funds are provided by the State, including central and local authorities, by subscriptions made by the classes who receive the benefit, and by voluntary contributions given in the form of charity by the wealthier sections of the public.

"The time seems to have come when the relation of these various efforts towards the same objects should be examined from a general and national point of view. At present there is no common aim realised by those who improve the lot of the needy or of persons depending on weekly wages and their families. There is a great overlapping in administration, owing to the absolute ignorance of charitable people as to what the working classes are themselves doing, or what provision is being made by the State, and *vice versa*. New charitable organisations are constantly springing up on a large scale, which merely duplicate the work of others and add greatly to the cost without necessity.

"The general effect of this want of system has been very unfair to the poor themselves, and has promoted a pauperised spirit.

"The want of recognised principle to guide the community in its aim of improving social conditions leads to all kinds of contradictory proposals, and Parliament and the nation alike are at sea and in a state of bewilderment when wide and far-reaching schemes for that end are set on foot."

Agricultural Committee.

A committee has been formed to inquire into the present condition of agricultural research. Mr. A. D. Hall has drawn up a report dealing with agricultural research in the United Kingdom. Mr. John Percival has drawn up a report dealing with the state of agricultural research in the Netherlands, Sweden, Denmark, and Germany, and the amount of State aid which is extended to the different experimental farms and institutions. The subject, however, being very broad, there still remains a large amount of work for the committee to undertake.

Franco-British Exhibition.

Owing to the action of the executive committee of the Guild in 1907, a special science committee, consisting of members of the British Science Guild and representatives of the Royal and other societies, with Sir Norman Lockyer as chairman, organised a separate Science Section of the Franco-British Exhibition. The executive of the exhibition most generously granted to the committee the use of the large building, which was specially erected for the purpose, having a floor space of 14,000 square feet. Not only did they build and grant this hall free of cost, but they also contributed a sum of 1000*l.* to defray the cost of the glass exhibition cases, with installation and other expenses. The total contribution of the executive to the cause of British science exceeded 7000*l.* The Guild feel that this public-spirited action on the part of the exhibition authorities calls for the highest praise. In no other international exhibition has a special portion been entirely devoted to science.

The Synchronisation of Clocks.

Attention was directed in the public Press by Sir John Cockburn to the divergence in time shown by the publicly exposed clocks in London and other large centres, also the inconvenience thus caused to the public. A suggestion was received by the executive committee that a subcommittee should be appointed to deal with the subject.

After careful consideration of evidence brought before it, the committee drew up the report printed in *NATURE* of August 13, 1908. This report was sent to the Lord Mayor, the London County Council, the General Post Office, His Majesty's Office of Works, the Local Government Board, the British Horological Institute, and the various railway companies. Most of the bodies referred to merely acknowledged receipt of the communication, or else expressed disinclination to act owing to administrative difficulties or to the expense of synchronisation. The reply received from the Public Health Department, Guildhall, City of London, is of special interest, as it states "that the Corporation on March 26, 1903, made it a condition of future consent to the erection of clocks over public ways in the City that they should be synchronised with Greenwich time."

Naming of Streets.

The executive council has considered the matter of naming new streets, and the re-naming of streets, the names of which it is intended to alter, after distinguished men of science, now deceased. The members of the executive committee were requested to send in names which they considered it would be desirable to employ in this way. A list containing a large number of names was thus drawn up, and was presented to the executive committee, who, after careful consideration, reduced it to the following thirty-one names:—Newton, Darwin, Harvey, Jenner, Huxley, James Watt, Gilbert, Kelvin, Faraday, Joule, Clerk Maxwell, Stokes, Tyndall, Captain Cook, Livingstone, Franklin, Ross, Bruce, Mungo Park, Cavendish, Dalton, Priestley, Boyle, Andrews, Halley, Herschel, Horrocks, Adams, Bradley, Howard, Piddington. This list was then sent to the County Council with the following letter:—

"I am directed by the president, Mr. Haldane, to ask you to be so good as to bring before the L.C.C. the striking difference which exists between the street nomenclature in London and Paris. In the latter City there is no illustrious French man of science whose name is not connected with some street or square. It is hardly too much to say that in London there is no case of which the same can be said."

"This matter has been inquired into by the executive committee of the British Science Guild, and I am directed to forward to you the accompanying list of thirty-one names; which they have carefully considered, and think could be properly used in this connection should the opportunity arise in the naming of new thoroughfares or the change of name of old ones."

"They are well aware that the present condition of things has arisen in the past because there has been no such body as the London County Council interested in the nation's history and intellectual development; in its absence, the builder and the owner of the land during the last 300 years have been the chief people interested."

New Patents and Designs Bill.

Two years ago the Guild appointed a committee to consider the question of the amendment of Patent Laws. Sir John Cockburn was also appointed to confer with the authorities of the Associated Chambers of Commerce, and to take part in a deputation to the President of the Board of Trade. It is with pleasure that the Guild is able to direct attention to the beneficial effect of the new Patent Act of 1907, the results of which are now beginning to be apparent.

So far back as 1884, in his presidential address to the Society of Chemical Industry, the late Sir William Perkin said that one of the causes of the loss of the coal-tar colour industry to this country was the condition of our patent laws. For more than twenty years Mr. Levinstein and others have been working to convince the Governments of the need of reform in this direction.

The consequences of the Act now in force are that, not only are many wealthy foreign firms building new factories

in this country, but that licences to work foreign patents are being obtained by many purely British firms which, before the passing of this Act, they were unable to secure. Messrs. Meister Lucius and Brunning, of Höchstam Main, in Germany, have erected a factory at Port Ellesmere, on the Mersey, and are now employing a large staff of workmen in the preparation of anilin dyes, synthetic indigo, and fine chemicals. The Badische Anilin- und Soda-Fabrik are also erecting large works on the Manchester Ship Canal. The Gillette Razor Company, of America, have works at Leicester. The German Pottery Co., of Alfred Johnson and Co., are starting works in Kent, and many other firms from abroad are setting up works at Liverpool, Manchester, Warrington, Enfield, Tottenham, and other localities. Altogether about twenty new works have been erected by foreign patentees owing to the passing of this new Act, and independent of these a large number of licences have been granted to British firms.

Formation of Sections in Australia and Canada.

A committee has been formed in Sydney, New South Wales, with the Hon. Sir H. Normand MacLaurin, Chancellor of Sydney University, as chairman, and Dr. Walter Spencer as secretary. A number of members have joined the New South Wales branch of the British Science Guild. In Montreal a strong committee has been brought together, with Mr. George E. Drummond as president and Prof. H. T. Barnes as secretary. It is intended to hold a meeting at the end of the winter, either in Montreal or Toronto, to inaugurate the Canadian branch of the Guild. The formation of branches of the Guild in the colonies will add strength to the parent society, and cannot fail to foster goodwill between the colonies and the Mother Country, thus helping to strengthen the fabric of the Empire.

Presentation of Illuminated Address to President Fallières.

The opportunity of the visit of the President of the French Republic to England to inspect the Franco-British Exhibition was taken advantage of to present him with an illuminated address. The movement was originated by Sir Norman Lockyer, and after consultation with the Royal Society and the Royal Academy, the Guild was asked to undertake the work. The address was presented on May 27, 1908, at St. James's Palace, and was received by M. Fallières in a most cordial manner.

SYSTEM AND SCIENCE IN EDUCATION.

Primary and Secondary Education.

AFTER taking into consideration the memorandum prepared by the chairman of the executive committee, the education committee has adopted the following resolutions which embody and extend those already submitted to the executive committee:—

(1) No local authority or other body should be empowered to grant total exemption from attendance at school to children under fourteen years of age.

(2) Provision should be made for compulsory attendance at day or evening (preferably day) continuation schools for young persons above the age of fourteen years, who are not attending craft or secondary schools, for two to four hours a week during two years of forty weeks in each year. Pupils attending evening continuation schools between these ages should not be permitted to commence work before 8 a.m. on those days on which they attend the schools. The number of hours during which pupils attend part-time day or evening continuation schools should be counted as "hours of employment" for the purpose of the Acts dealing with the employment of young persons.

(3) There should be established in all educational areas a sufficient number of craft schools with a two-years' course for boys and girls between the ages of about fourteen and sixteen years. Due regard should be paid in these schools to the continuance of the general education of the pupils, but special provision should be made for sound scientific and technical training in relation to the industries or requirements of the district. The aim of these schools should be to provide preparatory training in

¹ Reports of two committees of the British Science Guild presented at the annual general meeting on January 22.